

Road Maintenance Management Decision System Using Multi-Criteria and Geographical Information System for Takoradi Roads, Ghana

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Abstract : The road maintenance backlogs created as a result of deferred maintenance especially in developing countries has caused considerable deterioration of many road assets. This is usually due to difficulties encountered in selecting and prioritising maintainable roads based on objective criteria rather than some political or other less important criteria. In order to ensure judicious use of limited resources for road maintenance, five factors were identified as the most important criteria for road management within the study area. This was based on the judgements of 40 experts. The results were further used to develop weightings using the Multi-Criteria Decision Process (MCDP) to analyse and select road alternatives according to maintenance goal. Using Geographical Information Systems (GIS), maintainable roads were grouped using the Jenk's natural breaks to allow for further prioritised in order of importance for display on a dashboard of maps, charts, and tables. This reduces the problems of subjective maintenance and road selections, thereby reducing wastage of resources and easing the maintenance process through an object organised spatial decision support system.

Keywords : decision support, geographical information systems, multi-criteria decision process, weighted sum

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